

## CLAIMS

What is claimed is:

- 1           1.       An imaging system comprising:  
2           a focal plane array (FPA) having a plurality of pixels;  
3           a lens adapted to focus radiation from a scene in front of the lens onto the FPA  
4                behind the lens;  
5           a shutter located in front of the lens, the shutter having a closed state that produces  
6                a spatially uniform reference image signal and allows internal radiant flux  
7                of the system to reach detectors of the FPA, and an open state that allows an  
8                open state image signal that includes external scene radiation and internal  
9                radiant flux from the system to reach detectors of the FPA; and  
10          a signal processing module operatively coupled to the FPA, and adapted to correct  
11                the open state image signal based on the spatially uniform reference image  
12                signal.
- 1           2.       The system of claim 1 further comprising:  
2           a shutter controller operatively coupled to the shutter, and adapted to command the  
3                shutter to its opened and closed states.
- 1           3.       The system of claim 2 further comprising:  
2           a system controller communicatively coupled to the shutter controller and the  
3                signal processing module, and adapted to control operation of the imaging  
4                system.
- 1           4.       The system of claim 3 where the system controller is communicatively  
2           coupled to a network thereby enabling the imaging system to communicate with other  
3           systems also communicatively coupled to the network.
- 1           5.       The system of claim 1 further comprising:

2 a temperature controller adapted for illuminating the scene with radiation, thereby  
3 allowing reflected radiation to be received by the system.

1 6. The system of claim 5 further wherein the temperature controller includes a  
2 laser for illuminating the scene.

1 7. The system of claim 1 further wherein the shutter has a lens side surface  
2 that is located within five millimeters of the front of the lens.

1 8. The system of claim 1 wherein for any one session of imaging system  
2 operation, each of a plurality of open state image signals are corrected based on the closed  
3 state image signal.

1 9. The system of claim 1 wherein the closed state image signal is periodically  
2 generated to account for changes in the imaging system.

1 10. A method for imaging a scene, where method is carried out by an imaging  
2 system configured with a front lens mounted shutter, the method comprising:  
3 closing the front lens mounted shutter so that external scenes are blocked from  
4 being imaged;  
5 generating a closed state image signal that includes internal radiant flux of the  
6 system;  
7 opening the front lens mounted shutter thereby allowing the imaging system to  
8 receive external scene radiation;  
9 generating an open state image signal based on the received scene radiation; and  
10 correcting the open state image signal based on the closed state image signal.

1 11. The method of claims 10 wherein correcting the open state image signal  
2 includes compensating for pixel-to-pixel non-uniformities of a detector array included in  
3 the imaging system.

1           12.    The method of claims 10 wherein correcting the open state image signal  
2 includes compensating for offsets between the opened and closed states of the lens.

1           13.    The method of claims 10 wherein correcting the open state image signal  
2 includes compensating for pixel-to-pixel non-uniformities and offsets between the opened  
3 and closed states of the lens.

1           14.    The method of claims 10 wherein the external scene radiation includes IR  
2 radiation and the imaging system includes an IR sensitive FPA for generating the closed  
3 and open state image signals.

1           15.    A method for manufacturing an imaging system, the method comprising:  
2 providing a lens adapted to focus radiation from a scene in front of the lens onto a  
3 detector array behind the lens; and  
4 providing a shutter located in front of the lens, the shutter having a closed state that  
5 allows a closed state image signal that includes internal radiant flux of the  
6 system to be generated by the detector array, and an open state that allows  
7 an open state image signal that includes external scene radiation to be  
8 generated by the detector array.

1           16.    The method of claim 15 further comprising:  
2 providing a detector array having a plurality of pixels for detecting scene radiation;  
3 and  
4 operatively coupling a signal processing module to the detector array, the signal  
5 processing module adapted to correct open state image signals based on  
6 closed state image signals.

1           17.    The method of claim 16 further comprising:  
2 operatively coupling a shutter controller to the shutter, the shutter controller  
3 adapted to command the shutter to its opened and closed states.

- 1           18.    The method of claim 17 further comprising:  
2           operatively coupling a system controller to the shutter controller and processing  
3           module, the system controller adapted to control operation of the imaging  
4           system.
- 1           19.    The method of claim 15 further comprising:  
2           providing a laser adapted to illuminate a scene with radiation, thereby allowing  
3           reflected radiation to be received by the system.
- 1           20.    The method of claim 15 further wherein the shutter has a lens side surface  
2           that is located within five millimeters of the front of the lens.